Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1.   (Cancelled).

2.   (Previously Presented) A signal recording apparatus, comprising:

quantization means of quantizing a signal employing a quantization step;

quantization information creating means of creating plural pieces of quantization information to specify said quantization step;

encoding means of generating an encoded signal from said quantized signal; and

recording means of recording a compressed signal having data containing said plural pieces of quantization information and said encoded signal;

wherein said quantization step is a product of a basic quantization step and a multiplier factor to be combined with said basic quantization step, and

said data is a quantization number for specifying said basic quantization step and the multiplier factor information for specifying said multiplier factor to be combined with said basic quantization step.

3.   (Original) The signal recording apparatus according to claim 2, wherein said quantization step is uniform in a macro block comprised of DCT blocks,

said quantization number is recorded for each said macro block, and

said multiplier factor information is recorded for each said DCT block.

4.   (Previously Presented) A signal recording apparatus, comprising:

quantization means of quantizing a signal employing a quantization step;

quantization information creating means of creating plural pieces of quantization information to specify said quantization step;

encoding means of generating an encoded signal from said quantized signal;

recording means of recording a compressed signal having data containing said plural pieces of quantization information and said encoded signal; and

range conversion means of range converting said quantized signal using a range conversion multiplier factor which is represented as the power of 2,

wherein said data has the information regarding said range conversion multiplier factor.

5.   (Original) The signal recording apparatus according to claim 4, wherein said quantization step is a product of a basic quantization step and a multiplier factor to be combined with said basic quantization step, and

said plural pieces of quantization information are a quantization number for specifying said basic quantization step and the multiplier factor information for specifying said multiplier factor to be combined with said basic quantization step,

wherein the information involving the range conversion multiplier factor means the overall multiplier factor information consisting of the information regarding the range conversion multiplier factor and the information on the basis of said multiplier factor information.

6.   (Original) The signal recording apparatus according to claim 5, wherein the multiplier factor to be combined with said basic quantization step is the power of 2, said multiplier factor information being the power exponent,

and said overall multiplier factor information is a sum of its power exponent and the power exponent of the range conversion multiplier factor represented as the power of 2.

7. (Original) The signal recording apparatus according to claim 6, wherein said quantization step is uniform in a macro block comprised of DCT blocks,

said quantization number is recorded for each said macro block, and

said sum is recorded for each said DCT block.

8. (Original) The signal recording apparatus according to claim 7, wherein said signal has 12 bits,

said range converted signal has 9 bits, and

said overall multiplier factor information has 2 bits or less.

9.-10. (Cancelled).

11. (Previously Presented) A signal reproducing apparatus, comprising:

reproduction means of reproducing the data containing plural pieces of quantization information for specifying a quantization step used in quantizing the signal and an encoded signal to be generated from said quantized signal from a compressed signal recorded as a signal having the data and said encoded signal;

quantization step configuration means of configuring a quantization step on the basis of plural pieces of said reproduced quantization information; and

inverse quantization means of making the inverse quantization in accordance with said configured quantization step on the basis of said reproduced encoded signal;

wherein said quantized signal is range converted using a range conversion multiplier factor which is represented as the power of 2,

said data has the information regarding said range conversion multiplier factor,

Application No.: 09/811,682   MTS-3237US
Amendment Dated: August 23, 2006
Reply to Office Action of: June 1, 2006

said signal reproducing apparatus comprising inverse range conversion means of making the inverse range conversion on the basis of said encoded signal and the information regarding said range conversion multiplier factor, and

said inverse quantization in accordance with said configured quantization step being effected for said signal which has undergone the inverse range conversion on the basis of said encoded signal.

12. (Original) The signal reproducing apparatus according to claim 11, wherein said quantization step used in quantizing the signal is a product of a basic quantization step and a multiplier factor to be combined with said basic quantization step, and

said plural pieces of quantization information is a quantization number for specifying said basic quantization step and the multiplier factor information for specifying said multiplier factor to be combined with said basic quantization step,

wherein the information involving said range conversion multiplier factor means the overall multiplier factor information consisting of the information regarding its range conversion multiplier factor and the information on the basis of said multiplier factor information.

13. (Original) The signal reproducing apparatus according to claim 12, wherein the multiplier factor to be combined with said basic quantization step is the power of 2, said multiplier factor information being the power exponent, and

said overall multiplier factor information is a sum of its power exponent and the power exponent of the range conversion multiplier factor represented as said power of 2.

14. (Original) The signal reproducing apparatus according to claim 13, wherein said quantization step used in quantizing said signal is uniform in a macro block composed of DCT blocks,

said quantization number is recorded for each said macro block, and

said sum is recorded for each said DCT block.

15.   (Original) The signal reproducing apparatus according to claim 14, wherein said quantization step configured is a product of a not greater value among the minimum value of the sums recorded for said DCT blocks within said macro block and the maximum value which the multiplier factor information for specifying the multiplier factor to be combined with the basic quantization step can take, and a quantization number recorded for each said macro block.

16.   (Cancelled).

17.   (Currently Amended) A medium for carrying a program and/or the data for enabling a computer to execute all ~~or some~~-functions provided for means in ~~whole or part of~~-the invention according to any one of claims 2, 4 and 11, wherein said medium can be processed by said computer.

18.   (Currently Amended) A medium for carrying a program and/or the data for enabling a computer to execute all ~~or some~~-operations provided for steps in ~~whole or part of~~-the invention according to <u>any one of </u>claim<u>s</u> 24-26, wherein said medium can be processed by said computer.

19.-20. (Cancelled).

21.   (Previously Presented) A method for recording a compressed signal that has been encoded using at least one quantization step from a first set of quantization steps, the method including the steps of:

    (a)   recording the compressed signal;

    (b)   reducing the first set of quantization steps into a second set of quantization steps and a third set of multiplier factors,

    wherein (1) each quantization step in the first set is a different numerical value within the first set and (2) each quantization step in the second set is a different numerical value within the second set;

(c)   configuring the at least one quantization step of the first set by a respective one multiplier factor of the third set and by a respective one quantization step of the second set; and

(d)   recording the respective one quantization step and the respective one multiplier factor.

22.   (Previously Presented) The method of claim 21 wherein step (b) includes reducing the quantization steps of the first set into a fewer number of quantization steps of the second set.

23.   (Previously Presented) The method of claim 21 wherein step (c) includes configuring a plurality of quantization steps of the first set, by a respective plurality of multiplier factors of the third set and by a respective plurality of quantization steps of the second set, for encoding the compressed signal.

24.   (Previously Presented) A method for recording a signal, the method including the steps of:

quantizing a signal employing a quantization step;

creating plural pieces of quantization information to specify said quantization step;

generating an encoded signal from said quantized signal; and

recording a compressed signal having data containing said plural pieces of quantization information and said encoded signal;

wherein said quantization step is a product of a basic quantization step and a multiplier factor to be combined with said basic quantization step, and

said data is a quantization number for specifying said basic quantization step and the multiplier factor information for specifying said multiplier factor to be combined with said basic quantization step.

25.   (Previously Presented)   A method for recording a signal, the method including the steps of:

quantizing a signal employing a quantization step;

creating plural pieces of quantization information to specify said quantization step;

generating an encoded signal from said quantized signal;

recording a compressed signal having data containing said plural pieces of quantization information and said encoded signal; and

range converting said quantized signal using a range conversion multiplier factor which is represented as the power of 2,

wherein said data has the information regarding said range conversion multiplier factor.

26.   (Previously Presented)   A method for recording a signal, the method including the steps of:

reproducing the data containing plural pieces of quantization information for specifying a quantization step used in quantizing the signal and an encoded signal to be generated from said quantized signal from a compressed signal recorded as a signal having the data and said encoded signal;

configuring a quantization step on the basis of plural pieces of said reproduced quantization information; and

making the inverse quantization in accordance with said configured quantization step on the basis of said reproduced encoded signal;

wherein said quantized signal is range converted using a range conversion multiplier factor which is represented as the power of 2,

said data has the information regarding said range conversion multiplier factor,

said recording of a signal comprising making an inverse range conversion on the basis of said encoded signal and the information regarding said range conversion multiplier factor, and

said inverse quantization in accordance with said configured quantization step being effected for said signal which has undergone the inverse range conversion on the basis of said encoded signal.